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New records of microfungi from Turkey (Bartin Province)

Ali Savaş Bülbül[1*] & Elşad Hüseyin[2]

[1]*Department of Molecular Biology and Genetics, Science Faculty, Bartın University, Bartin,74100,Turkey*

[2]*Department of Biology, Arts and Sciences Faculty, Ahi Evran University, Kırşehir,40100 Turkey*

*Correspondence to: *asavasbulbul@gmail.com*

Abstract — *Cheiromyces stellatus, Coniothyrium ruscicola, Metasphaeria errabunda, Mycosphaerella winteri, Nectria viridescens, Neosetophoma samararum, Oletheriostrigula papulosa* and *Physalospora eriostega* are recorded for the first time for the Turkish mycobiota, and are described and illustrated based on Turkish specimens. These represent the first records from Turkey of the genera *Cheiromyces, Neosetophoma*, and *Oletheriostrigula*.

Key words — *Ascomycota*, fungal diversity, anamorph, teleomorph

Introduction

Bartin province (41°53' N 32°45' E), located on the northwest coast of the Black Sea region, is characterized by its temperate marine ("Black Sea") climate with hot summers and cool winters (Akman 1990). Around Bartin (Karabuk-Zonguldak, Bartin) the Euro-Siberian vegetation type is common and dominant but mixed with a considerable number of Mediterranean species. Mediterranean maquis communities, composed of such species as *Carpinus betulus* L., *Fagus orientalis* Lipsky, and *Castanea sativa* Miller, occur near the Bartin river, although they are generally spread throughout the coastal region. The vegetation and humid climate create favourable conditions for development of fungi.

Although the Bartin forest ecosystem vegetation has been sufficiently examined, but the microfungi of this region are little known. During a recent field study, we collected more than one hundred plant specimens showing symptoms of microfungal infection. Among these specimens, 45 species from 35 genera of *Ascomycota* and *Basidiomycota* were identified. Three ascomycete genera and eight species represent new records for the mycobiota of Turkey. The eight microfungi are described here.

Materials & methods

Fungal specimens were collected in September 2012 during a special research field trip in Peliken forest ecosystems of Bartin Province. The specimens were cut by hand into sections using a razor blade and microscopically examined using Leica DM-E compound microscope. The fungi were identified using the relevant literature (Saccardo 1882; Saccardo & Saccardo 1905; Grove 1935; Tomilin 1979; Dennis 1981; Byzova & Vasyagina 1981; Sutton 1985, 2004; Huhndorf & Harris 1996; Mel'nik 2000; Gruyter et al. 2010). Host plants were identified using the "Flora of Turkey and East Aegean Islands" (Davis 1965–85). Species names follow Index Fungorum (2013), and author names follow Kirk et al. (2008). All specimens are deposited in the Herbarium of Bartin University, Bartin, Turkey (HBU); collection numbers of Elşad Hüseyin are prefixed with EH. Genera new for Turkey are marked with an asterisk (*).

Results

Coniothyrium ruscicola D. Sacc., Mycoth. Ital.: no. 1694. 1913. Fig. 1

Conidiomata black, scattered, immersed, opening by a rounded, simple, distinct ostiole 10–15 µm in diam., globose, 100–120 µm diam. Conidia unicellular, yellowish-green, biguttulate, straight or slightly curved, narrowly ellipsoid or cylindrical with rounded ends, 5–9 × 2.5–3(–3.5) µm.

Causing roundish, ellipsoidal, brownish, spots on cladodes, 1–5 mm in diam., with a reddish brown border.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 80 m a. s. l., on living cladodes of *Ruscus hypoglossum* L., 16.IX.2012. E. Hüseyin EH-B 19 (HBU).

Notes: Conidia of the Turkish material are similar in size to those described by Grove (1935, as *Phyllosticta ruscicola:* 7–8 × 3.5 µm).

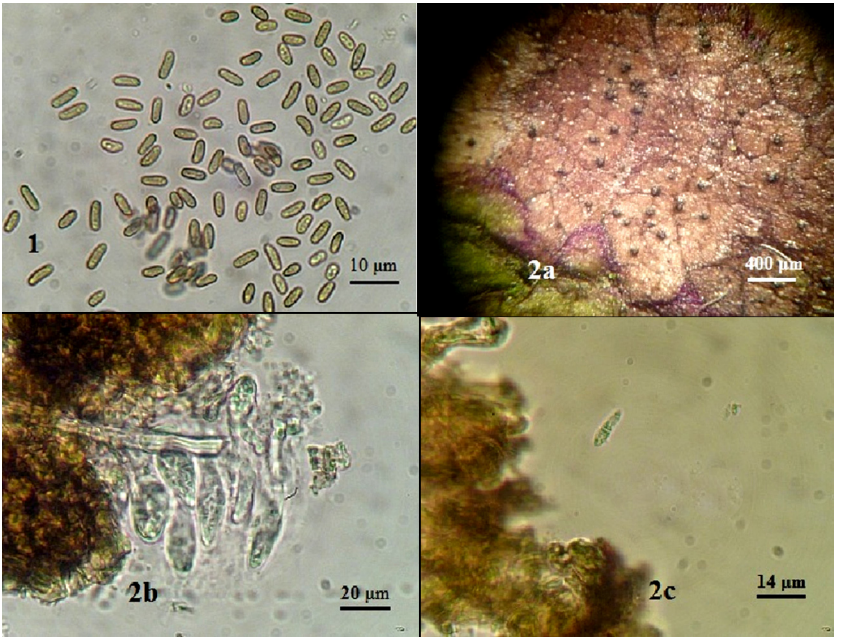
Mycosphaerella winteri (Pass.) Tomilin, Nov. Sist. Niz. Rast. 5: 168. 1968. Fig. 2

Ascomata epiphyllous, scattered, immersed or partly erumpent, dark brown or almost black, sphaerical, 60–90 µm diam., with an ostiole 15–20 µm diam. Asci 8-spored, fasciculate, straight or slightly curved, sessile or short-stalked, clavate or almost cylindrical, 35–45 × 8–10(–11) µm. Ascospores distichous, straight or slightly curved, hyaline, uniseptate, clavate or almost fusiform, 12–15 × 2.5–3.5 am.

On leaves, causing rounded to irregular leaf spots, 4–13(–15) mm diam., confluent, dark brown, with pale brown center.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 80 m a.s.l., on living leaves of *Rubus sanctus* Schreb., 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 22 (HBU).

Notes: Ascomata and asci of the Turkish material are similar in size to those presented by Tomilin (1979: ascomata 80–100 µm diam., asci 35–40 × 8–10 µm).



Figs. 1–2. (1) ***Coniothyrium ruscicola:*** conidia. (2) ***Mycosphaerella winteri:*** a. ascomata; b. asci; c. ascospore.

Metasphaeria errabunda Feltgen, Vorstud Pilzfl. Luxemb., Nachtr. 3: 235. 1903. Fig. 3

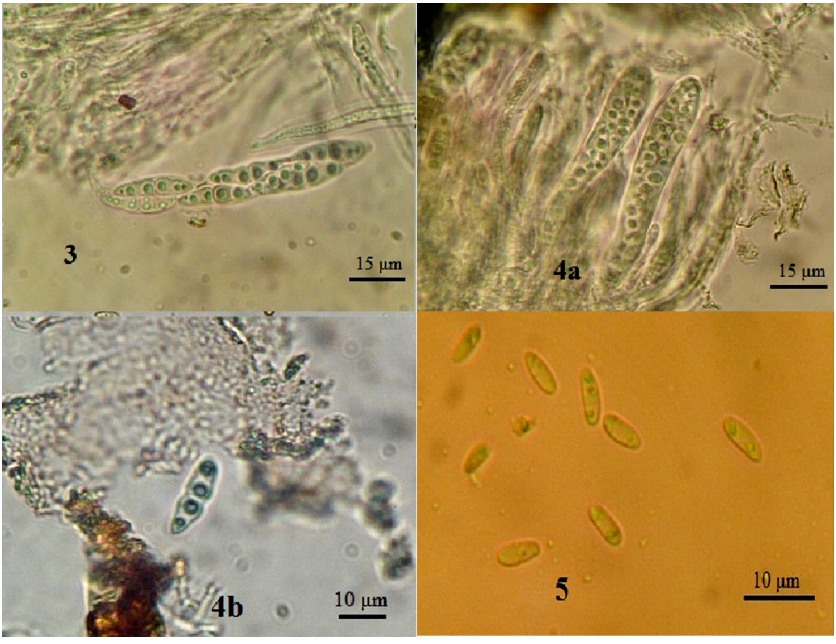
Ascomata scattered or grouped, black, globose-depressed, subimmersed or superficial, 85–160 µm diam. Asci 8-spored, fasciculate, short-stalked, paraphysate, clavate-fusiform, 77–95 × 10–12(–15) µm. Ascospores distichous, hyaline, 3-septate, constricted at the middle septum, 4-guttulate, slightly curved, fusiform, 20–25 × 4–6 µm.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 70 m a. s. l., on thin dead branches of *Ilex aquifolium* L., 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 29 (HBU).

Notes: The Turkish asci are longer than described by Saccardo & Saccardo (1905: asci 55–75 × 10–12 µm), but the ascomata and ascospores are similar (Saccardo & Saccardo 1905: ascomata 70–150 µm diam.; ascospores 16–22 × 3–5 µm).

****Oletheriostrigula papulosa*** (Durieu & Mont.) Huhndorf & R.C. Harris, Brittonia 48: 551. 1996. Fig. 4

Ascomata amphigenous, numerous, immersed, black, subglobose, 130–150 µm diam. Asci 8-spored, paraphysate, short clavate, 65–85 × 10–12(–12.5)



Figs. 3–5. (3) ***Metasphaeria errabunda:*** ascus with ascospores. (4) ***Oletheriostrigula papulosa:*** a. asci; b. ascospore. (5) ***Neosetophoma samararum:*** conidia.

µm. Ascospores hyaline or pale, distichous, 3-septate, 4-guttulate, straight or slightly curved, ellipsoid-fusiform, 18–20 × 5–5.5 µm.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 66 m a. s. l., on living leaves of *Rhododendron ponticum* L., 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 14 (HBU).

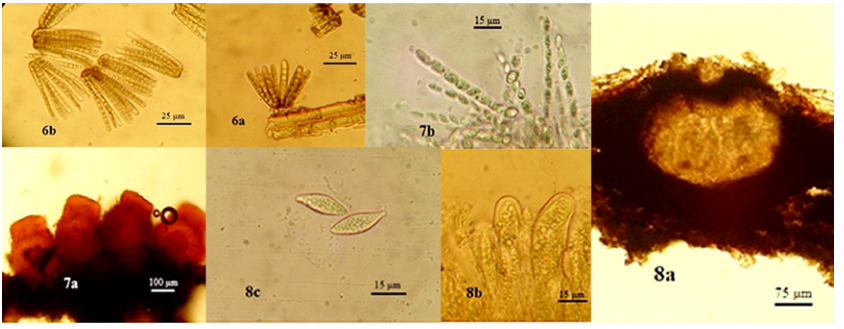
Note: Asci in Bulgarian material of *O. papulosa* (Hüseyin et al. 2011: 65–85 × 13–15 µm) are wider than those in the Turkish material.

****Neosetophoma samararum*** (Desm.) Gruyter, Avescamp & Verkley, Mycologia 102: 1075. 2010. Fig. 5

Conidiomata immersed, erumpent, black, globose, 250–280 µm diam. Conidiophores hyaline, filiform, (18–)20–25 × 1 µm. Conidia biguttulate, unicellular, hyaline, cylindrical with rounded ends, 6–7.5 × 2–2.5 µm.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 70 m a.s.l., on the wing of fruit of *Acer campestre* L., 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 27 (HBU).

Notes: Conidia of *N. samararum* have been reported at 7 × 2.5 µm (Grove 1935; Gruyter et al. 2010), slightly wider than found in the Turkish material.



Figs. 6–8. (6) ***Cheiromyces stellatus:*** a. fragment of sporodochium; b. conidia. (7) ***Nectria viridescens:*** a. ascomata; b. asci with ascospores. (8) ***Physalospora eriostega:*** a. vertical section of ascomata; b. asci; c. ascospores.

****Cheiromyces stellatus*** Berk. & M.A. Curtis, Grevillea 3: 97. 1875. Fig. 6

Sporodochia scattered, single, superficial, flattened, circular or ellipsoidal, golden-brown, ≤210 µm diam. Conidiophores absent. Conidiogenous cells discrete, doliiform, pale brown, 4–5 × 3.5–4 µm. Conidia palmiform, consisting of truncated bottom basal cell, 4–4.5 µm wide, and (3–)5–12(–14) pale brown, vertical, slightly divergent or closely contiguous, more or less straight, cylindrical arms. Arms of the conidia 4–12(–14)-distoseptate with strongly reduced cell cavities, not constricted or only slightly constricted at septa, unbranched, straight, more or less of equal length, (22–)25–30(–56) × 4–5 µm. Apical cell of each arm almost hyaline and slightly longer and wider than the other cells of the arm.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 70 m a.s.l., on dead thin branches of *Ilex aquifolium*, 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 28 (HBU).

Notes: Arms of conidia in *C. stellatus* are given by Mel'nik (2000) as 23–40 × 4–7 µm, slightly wider than measured for the Turkish material.

Nectria viridescens C. Booth, Mycol. Pap. 73: 89. 1959. Fig. 7

Stromata ≤0.2 cm diam., densely, fleshy, reddish brown, erumpent from the bark. Perithecia bright-orange-red, with papillate ostiole, densely crowded, rounded, 170–210 µm diam. Asci 8-spored, surrounded by filiform paraphyses, cylindrical, 60–75 × 5–6 µm. Ascospores uniseriate, hyaline, uniseptate, not constricted, ellipsoidal, 6–7.5(–10) × 2.5–3 µm.

Material examined: **TURKEY**, **Bartin Province**, Peliken area, 66 m a.s.l., on dead branches of *C. betulus*, 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 3 (HBU).

Notes: The Turkish perithecial sizes fall within ranges previously reported for *N. viridescens:* 200–250 × 150–200 µm (Booth 1959), 125–200 µm diam

(Dennis 1981), and 270–350 × 250–350 µm (Byzova & Vasyagina 1981). Asci and ascospores in the Turkish material are smaller than reported elsewhere (Booth 1959: asci 68–76 × 6–9 µm; Dennis 1981: ascospores 7.5–10 × 4–5 µm).

Physalospora eriostega (Cooke & Ellis) Sacc., Syll. Fung. 1: 443. 1882. Fig. 8

Ascomata numerous, scattered, immersed, with only stomata erumpent, subepidermal, black, depressed-globose, 220–350 µm diam. Asci 8-spored, paraphysate, thick, short-stalked, broadly clavate, 80–100 × 15–20 µm. Ascospores distichous, hyaline, unicellular, broadly lanceolate, ellipsoidal, 25–33 × 9–12 µm.

Material examined: **TURKEY, Bartin Province**, Peliken area, 80 m a.s.l., on dead branches of *Laurus nobilis* L., 16.IX.2012, A.S. Bülbül & E. Hüseyin EH-B 32 (HBU).

Notes: The ascospores of *P. eriostega* on *L. nobilis* from Bartin province are smaller than those reported on *L. sassafras* L. by Saccardo (1882: 35 × 12 µm).

Discussion

The above eight species represent new records for Turkey and have not been included in previous publications on Turkish microfungi (Bremer & Petrak 1947; Bremer et al. 1948, 1952a,b; Petrak 1953, 1957; Karel 1958; Lohwag 1963; Göbelez 1963, 1964; Öner & Ekmekçi 1974; Tamer & Öner 1978; Baydar 1982; Öner et al. 1984; Tamer et al. 1989, 1990; Güven & Tamer 1993; Altan and Tamer 1996; Hüseyinov & Selçuk 1999; Hüseyin & Selçuk 2001; Hüseyin et al. 2003, 2009; Melnik et al. 2004; Erdoğdu & Hüseyin 2008; Stoykov & Denchev 2007; Göçmen et al. 2011). *Cheiromyces* Berk. & M.A. Curtis, *Neosetophoma* Gruyter et al., and *Oletheriostrigula* Huhndorf & R.C. Harris represent new generic records for Turkey.

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